Small Business Innovation Research/Small Business Tech Transfer

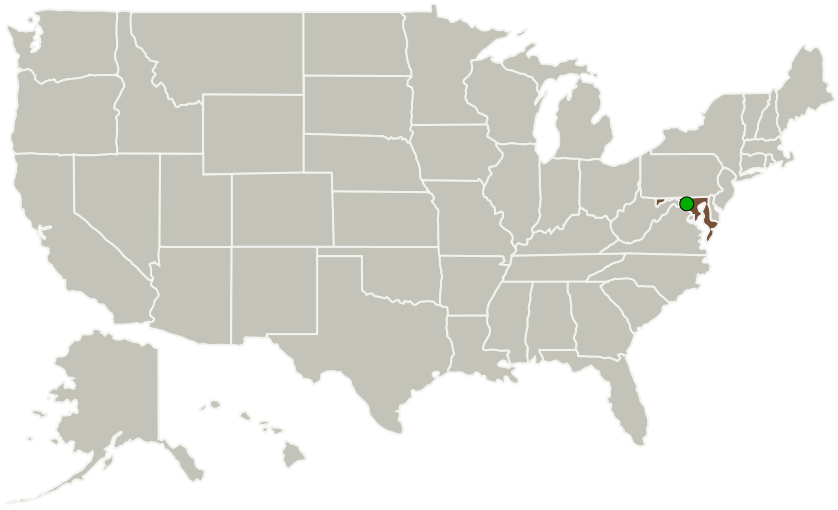
Scalable Architectures for Distributed Beam-Forming Synthetic Aperture Radar (DBSAR), Phase II

Completed Technology Project (2016 - 2019)

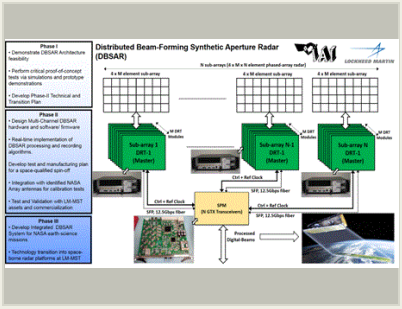
Project Introduction

Conventional SAR operates in the Stripmap mode. Wide unambiguous swath coverage and high azimuth resolution pose contradictory requirements on the design of SAR systems. A promising technique to overcome this limitation is Digital Beam-Forming (DBF) on receive where the receiving antenna is split into multiple sub-apertures. This provides the capability of forming multiple beams via post-processing. DBF techniques applied to SAR systems can increase receiving antenna gain without a reduction of the imaged area and suppress interference signals. A highly capable DBSAR instrument design would consist of wideband Transmitter-Receiver Module (TRM), precise multi-channel timing and synchronization and reconfigurable processing engine that can host the SAR processing, calibration and control routines. IAI?s proposed approach is modular, scalable and meets the NASA goals of developing an innovative analog/digital hardware design for the implementation of distributed DBSAR architectures.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Intelligent Automation, Inc.	Lead Organization	Industry	Rockville, Maryland
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland



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Primary U.S. Work Locations

Maryland

Project Transitions

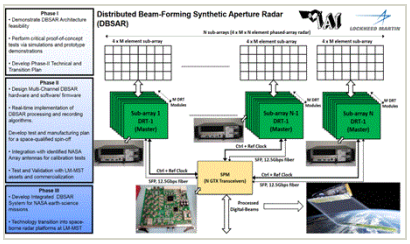
May 2016: Project Start

December 2019: Closed out

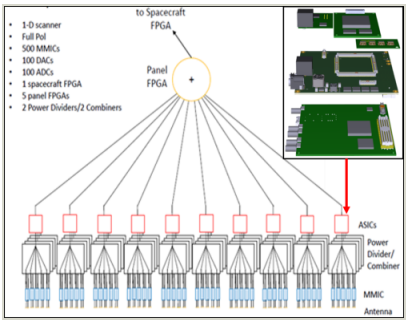
Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139834)*

Images



Briefing Chart Image
Scalable Architectures for Distributed Beam-Forming Synthetic Aperture Radar (DBSAR), Phase II
(https://techport.nasa.gov/image/132726)



Final Summary Chart Image
Scalable Architectures for Distributed Beam-Forming Synthetic Aperture Radar (DBSAR), Phase II
(https://techport.nasa.gov/image/131775)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Intelligent Automation, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Arvind Bhat

Co-Investigator:

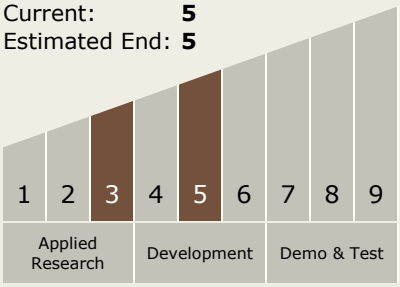
Arvind Bhat

Scalable Architectures for Distributed Beam-Forming Synthetic Aperture Radar (DBSAR), Phase II

Completed Technology Project (2016 - 2019)

Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**



Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.4 Microwave, Millimeter-, and Submillimeter-Waves

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System